

APPLICATION  
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TITLE: WEB-BASED DIGITAL RIGHTS MANAGEMENT (DRM)  
ENCODER

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## **WEB-BASED DIGITAL RIGHTS MANAGEMENT (DRM) ENCODER**

### **BACKGROUND**

[0001] The Internet is increasingly being used to buy, sell, and send copyrighted content (e.g., music, video, and image files) in digital form. Digital Rights Management (DRM) systems have been developed to protect digital media from unauthorized use once it is outside the control of the publisher or distributor and to track the distribution and use of the content.

[0002] In a typical DRM scheme, an individual is given rights to a piece of content based on certain conditions. For instance, the user may be allowed to view a file once, view a number of files at a website for a set period of times, or view a file on a particular machine or device. The content, if stored locally on a user's machine, is usually encrypted so it cannot be accessed without the proper authentication or key.

[0003] A provider of digital content may use a third party DRM network server to package or "wrap" the content and to create and handle license distribution. The packaging may include encrypting the content and associating digital rights with the content. However, this

may require that the content be transferred to the third party server. This may be undesirable for the content provider, who may wish to host the content locally and therefore prefer that the content not leave the content provider's system.

#### **SUMMARY**

[0004] A digital rights management (DRM) system includes an application service provider (ASP) that provides a gateway to a DRM engine and acts as a license clearinghouse for one or more client content providers. The ASP provides a web-based DRM encoder that enables a client to encode digital content and package (e.g., encrypt and associate digital rights) the client's content locally. The client may then serve the packaged content to customers. The ASP may monitor and control the web-based encoding and handles license generation and issuance of the licenses. License handling may include delivering the keys required by the customers to access the packaged content and tracking content distribution.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

[0005] Figure 1 is a block diagram of a DRM (Digital Rights Management) system.

[0006] Figure 2 is a screen shot of an on-line encoding station web page.

[0007] Figures 3A-3B show a flowchart describing a web-based local DRM encoding process.

#### DETAILED DESCRIPTION

[0008] Figure 1 shows a digital rights management (DRM) system 100 according to an embodiment. An application service provider (ASP) 105 provides a gateway to a DRM engine 110 and acts as a license clearinghouse for one or more client content providers 115. The ASP 105 provides a Web-based DRM encoder that enables a client to encode digital content and package or "wrap" (e.g., encrypt and associate digital rights) the client's content locally. The digital content may include audio, video, and image files, as well as text files, electronic books, and application and game programs. The digital content may be downloadable files or streaming media. The client may then serve the packaged content to customers. The ASP 105 may control and monitor the web-based encoding and handles license generation and issuance of the licenses. License handling may include delivering the keys required by the customers to access the packaged content and tracking content distribution.

[0009] The ASP 105 may include a license database 120 for storing license-related information, e.g., key ID, license seed key, rights and conditions of licenses, and custom attributes (name/value pairs) such as a description of the license. The ASP 105 may also include a web server 125 for hosting the license management and controlling the web-based encoder. The DRM engine 110 includes applications for packaging content and managing rights. In an embodiment, the DRM engine is a Microsoft® Windows Media® Digital Rights Management (DRM) system and includes DRM programs developed using the Windows Media Rights Manager Software Development Kit (SDK).

[0010] The client content provider 115 may include a storage device 130, including unencoded and unpackaged digital content, a CPU (Central Processing Unit) 135, an operating system (OS) 140, a browser 145 for communicating over the Internet, and a web server 150 for hosting packaged content.

[0011] A customer device 160, e.g., a web-enabled personal computer (PC) or portable device, includes a media player 165 that supports the DRM system utilized by the ASP 105 and client content provider 115.

[0012] The client content provider 115 may use the web-based encoder to encode and package digital content

locally, i.e., at the client content provider's site. A software package 162 may be installed on the client content provider to enable the web-based encoder. The installation package 162 may include code for calling and running the web-based encoder. In an embodiment, the installation package includes an ActiveX object and encoder specific DLL (dynamic link library) and/or EXE (executable) files. For example, for the Microsoft® Windows Media® Digital Rights Management (DRM) system, the DLLs stored on the client content provider may include enrollobj.dll, wmmobjs.dll, commdlg32.ocx, and shdocvw.dll, several of which may be integral to a Windows-based operating system. Once installed, the ActiveX object may be used to open a web page 170 hosted by the ASP's web server 125.

[0013] The web page 170 may present a display screen with fields that allow the user to enter the names of digital content files to be encoded and packaged. Figure 2 shows an exemplary display screen 200 with such fields. The server may control the local encoding process using SOAP (Simple Object Access Protocol) commands coming through the HTTP (Hypertext Transfer Protocol) interface with the web page 170. SOAP is a protocol that enables a program running in one kind of operating system (such as Windows 2000) to communicate with a program in the same or

another kind of an operating system (such as Linux) using HTTP and XML (Extensible Markup Language) as the mechanisms for information exchange. Since Web protocols are installed and available for use by all major operating system platforms, HTTP and XML provide an already at-hand solution to the problem of how programs running under different operating systems in a network can communicate with each other. SOAP specifies how to encode an HTTP header and an XML file so that a program in one computer can call a program in another computer and pass it information. It also specifies how the called program can return a response.

[0014] The web page 170 may open the selected content files in the field using, e.g., a "commdialog" control. The web-based encoder, run as an ActiveX object embedded in the web page, may encode the digital content and package the encoded content. The files may be encoded and packaged into a desired digital format (e.g., WMF (Windows Media Format)) using library objects in response to data and/or commands from the server over the HTTP interface.

[0015] Figure 3 is a flowchart describing a web-based local encoding process 300 according to an embodiment. As shown in the flowchart, steps in the process may be performed in parallel at the client 115 and server 105. A

user at the client 115 may open the web page portal to the on-line encoder using the ActiveX object (block 305). The user may first login to the on-line encoding station. The web page may then provide a display screen, such as that shown in Figure 2, which enables the user to select files to encode and set names corresponding the encoded files to be created (block 310). The file names may be sent to the ASP 105 over the HTTP link via SOAP commands (block 315).

[0016] The ASP 105 identifies the information from the client 115 as a request for a web-based DRM encoding session. In an embodiment, the encoding application may require enrollment information from the party intending to encode files. The ASP 105 may store this information in a client database and send it to the client when the user activates the on-line encoder (block 320). The web page may open the file to encode using a commdialog command and then encode the file in a desired format using the ActiveX object and library objects at the client (block 320).

[0017] The DRM engine 110 at the ASP 105 may generate a key ID for the file, and then retrieve a license key seed associated with the particular client content provider. The DRM engine 110 may generate a key for the file using the key ID and the license key seed. The ASP 105 may also generate content header information (e.g., the key ID,



content ID, license acquisition URL, and attributes). The ASP 105 may then send the key and content header for the file to the client via the HTTP interface of the web page (block 330). The ASP 105 may store the key and content header information along with rights information in a database.

[0018] The ActiveX object at the client 115 may then begin packaging the encoded file using the information from the ASP 105, i.e., the key and content header (block 340). During the packaging operation, the ActiveX object may send DRM events to the ASP 105 via the SOAP interface (block 345). The DRM engine at the ASP 105 may interpret the DRM events and send corresponding status information (e.g., starting, percent complete, finishing) back to the client via the web link for display to the user (block 350). The DRM events are sent between the client and server until the packaging process is complete (block 355). When all of the selected files are encoded and packaged (block 360), the web page is closed (block 365). The encoded and packaged file may then be stored on the client web server for hosting to customers (block 370).

[0019] In an embodiment, the encoding object supports a variety of properties, allowing the web page it is embedded

in to make changes to the encoding settings of a file.

Available properties may include:

```
SetSeed(Seed As String)
SetRegPage(regPage As String)
SetKey(Optional kid As String)
GetSeed()
GetHeader()
SetContentServerPrivKey(cspvk As String)
SetContentServerPubKey(cspbkey As String)
SetInputFile(inputFileName As String)
SetOutputFileName(outputFileName As String)
```

[0020] The system may support pre-delivery and/or post-delivery of licenses. For pre-delivery, the license may be delivered just before playback for each object being played. When the customer 160 selects and gains authorization to access a file (e.g., by paying a fee or entering registration information), the client content provider 115 may send a request to the ASP 105 including the content header information of the file and the customer's address (e.g., IP address). The ASP 105 may then generate a license from the license seed key for the client content provider and the key ID in the content header and deliver the license directly to the customer's machine prior to the customer downloading or streaming the file. The DRM-capable media player on the customer's machine may then use the license to access the encrypted digital content file. Alternatively, the media player may

use the license URL in the content header to send the request directly to the ASP 105.

[0021] Although the encoding object is described as an ActiveX object, the object may be produced using other programming languages, such as Java.

[0022] The computer programs (also known as programs, software, software applications or code) described herein may include machine instructions for a programmable processor, and can be implemented in a high-level procedural and/or object-oriented programming language, and/or in assembly/machine language. As used herein, the term "machine-readable medium" refers to any computer program product, apparatus and/or device (e.g., magnetic discs, optical disks, memory, Programmable Logic Devices (PLDs)) used to provide machine instructions and/or data to a programmable processor, including a machine-readable medium that receives machine instructions as a machine-readable signal. The term "machine-readable signal" refers to any signal used to provide machine instructions and/or data to a programmable processor.

[0023] To provide for interaction with a user, the systems and techniques described here can be implemented on a computer having a display device (e.g., a CRT (cathode ray tube) or LCD (liquid crystal display) monitor) for

displaying information to the user and a keyboard and a pointing device (e.g., a mouse or a trackball) by which the user can provide input to the computer. Other kinds of devices can be used to provide for interaction with a user as well; for example, feedback provided to the user can be any form of sensory feedback (e.g., visual feedback, auditory feedback, or tactile feedback); and input from the user can be received in any form, including acoustic, speech, or tactile input.

**[0024]** A number of embodiments have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, blocks in the flowcharts may be skipped or performed out of order and still produce desirable results. Accordingly, other embodiments are within the scope of the following claims.